

FIG. 1

2/9

File	Context
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<p>Hematopoietic progenitor kinase 1 (HPK1) is a member of the mitogen-activated protein kinase kinase kinase (MAP4K) family and an upstream activator of the c-Jun N-terminal kinase (JNK) signaling cascade. HPK1 interacts, through its proline-rich domains, with growth factor receptor-bound 2 (Grb2), CT10-regulated kinase (Crk), and Crk-like (CrkL) adaptor proteins. We identified a novel HPK1-interacting protein of 55 kDa (HIP-55), similar to the mouse SH3P7 protein, containing an N-terminal actin-binding domain and a C-terminal Src homology 3 domain. We found that HPK1 bound to HIP-55 both in vitro and in vivo. When co-transfected, HIP-55 increased HPK1's kinase activity as well as JNK1's kinase activity. A dominant-negative HPK1 mutant blocked activation of JNK1 by HIP-55 showing that HIP-55 activates the JNK1 signaling pathway via HPK1. Our results identify a novel protein, HIP-55, that binds to HPK1 and regulates the JNK1 signaling cascade.</p>	
104	100
110	112
112	114
112	112
110	112

<ul style="list-style-type: none"> Entities <ul style="list-style-type: none"> MAP4K1:HPK1 118 Jun: c-Jun MAPK8: JNK, JNK1 Rsp: receptor 119 GRB2: Grb2 MAGEE1: CT10 CRK: Crk CRKL: CrkL HIP-55: HIP-55 Dbnl: SH3P7 Act5C: actin SRC: Src 	<ul style="list-style-type: none"> Interactions <ul style="list-style-type: none"> activated: (MAP4K1, Jun, MAPK8) bound: (MAP4K1, Rsp, GRB2, MAGEE1, CRK, CRKL) regulated: (MAP4K1, Rsp, GRB2, MAGEE1, CRK, CRKL) binding: (MAP4K1, HIP-55, Dbnl, Act5C, SRC) bound: (MAP4K1, HIP-55) increased: (HIP-55, MAP4K1, MAPK8) 114 activation: (MAP4K1, MAPK8, HIP-55) blocked: (MAP4K1, MAPK8, HIP-55) binds: (HIP-55, MAP4K1, MAPK8) regulates: (HIP-55, MAP4K1, MAPK8)
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120 130

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102

Fig. 2

104 3/9 100

File	Context			
URL []				
<p>Hematopoietic progenitor kinase 1 (HPK1) is a member of the mitogen-activated protein kinase kinase kinase (MAP4K) family and an upstream activator of the c-Jun N-terminal kinase (JNK) signaling cascade. HPK1 interacts, through its proline-rich domains, with growth factor receptor-bound 2 (Grb2), CT10-regulated kinase (Crk), and Crk-like (CrkL) adaptor proteins. We identified a novel HPK1-interacting protein of 55 kDa (HIP-55), similar to the mouse SH3P7 protein, containing an N-terminal actin-binding domain and a C-terminal Src homology 3 domain. We found that HPK1 bound to HIP-55 both in vitro and in vivo. When co-transfected, HIP-55 increased HPK1's kinase activity as well as JNK1's kinase activity.</p>				
110 —				
150 —				
154 —				
156 —				
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;"> Entities <ul style="list-style-type: none"> MAP4K1: HPK1 Jun: c-Jun MAPK8: JNK, JNK1 Rsp: receptor GRB2: Grb2 MAGEE1: CT10 CRK: Crk CRKL: CrkL HIP-55: HIP-55 Dbnl: SH3P7 Act5C: actin SRC: Src </td> <td style="width: 50%;"> Interactions <ul style="list-style-type: none"> activated: (MAP4K1, Jun, MAPK8) bound: (MAP4K1, Rsp, GRB2, MAGEE1, CRK, CRKL) regulated: (MAP4K1, Rsp, GRB2, MAGEE1, CRK, CRKL) binding: (MAP4K1, HIP-55, Dbnl, Act5C, SRC) bound: (MAP4K1, HIP-55) increased: (MAP4K1, MAPK8) HIP-55 — 114 <ul style="list-style-type: none"> ↳ Unassigned — 132 <ul style="list-style-type: none"> MAP4K1: HPK1 MAPK8: JNK, JNK1 ↳ Affectors — 134 <ul style="list-style-type: none"> HIP-55: HIP-55 ↳ Affected — 136 activation: (MAP4K1, MAPK8, HIP-55) 130 — blocked: (MAP4K1, MAPK8, HIP-55) </td> </tr> </table>			Entities <ul style="list-style-type: none"> MAP4K1: HPK1 Jun: c-Jun MAPK8: JNK, JNK1 Rsp: receptor GRB2: Grb2 MAGEE1: CT10 CRK: Crk CRKL: CrkL HIP-55: HIP-55 Dbnl: SH3P7 Act5C: actin SRC: Src 	Interactions <ul style="list-style-type: none"> activated: (MAP4K1, Jun, MAPK8) bound: (MAP4K1, Rsp, GRB2, MAGEE1, CRK, CRKL) regulated: (MAP4K1, Rsp, GRB2, MAGEE1, CRK, CRKL) binding: (MAP4K1, HIP-55, Dbnl, Act5C, SRC) bound: (MAP4K1, HIP-55) increased: (MAP4K1, MAPK8) HIP-55 — 114 <ul style="list-style-type: none"> ↳ Unassigned — 132 <ul style="list-style-type: none"> MAP4K1: HPK1 MAPK8: JNK, JNK1 ↳ Affectors — 134 <ul style="list-style-type: none"> HIP-55: HIP-55 ↳ Affected — 136 activation: (MAP4K1, MAPK8, HIP-55) 130 — blocked: (MAP4K1, MAPK8, HIP-55)
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102

Fig. 3

4/9

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Hematopoietic progenitor kinase 1 (HPK1) is a member of the mitogen-activated protein kinase kinase kinase (MAP4K) family and an upstream activator of the c-Jun N-terminal kinase (JNK) signaling cascade. HPK1 interacts, through its proline-rich domains, with growth factor receptor-bound 2 (Grb2), CT10-regulated kinase (Crk), and Crk-like (CrkL) adaptor proteins. We identified a novel HPK1-interacting protein of 55 kDa (HIP-55), similar to the mouse SH3P7 protein, containing an N-terminal actin-binding domain and a C-terminal Src homology 3 domain. We found that HPK1 bound to HIP-55 both in vitro and in vivo. When co-transfected, [HIP-55] increased HPK1's kinase activity as well as JNK1's kinase activity.

Entities

- MAP4K1: HPK1
- Jun: c-Jun
- MAPK8: JNK, JNK1
- Rsp: receptor
- GRB2: Grb2
- MAGEE1: CT10
- CRK: Crk
- CRKL: CrkL
- HIP-55: HIP-55
- Dbnl: SH3P7
- Act5C: actin
- SRC: Src

Interactions

- activated: (MAP4K1, Jun, MAPK8)
- bound: (MAP4K1, Rsp, GRB2, MAGEE1, CRK, CRKL)
- regulated: (MAP4K1, Rsp, GRB2, MAGEE1, CRK, CRKL)
- binding: (MAP4K1, HIP-55, Dbnl, Act5C, SRC)
- bound: (MAP4K1, HIP-55)
- increased: (HIP-55, MAP4K1, MAPK8)
 - Unassigned
 - MAP4K1: HPK1
 - Affectors
 - HIP-55: HIP-55
 - Affected
 - MAPK8: JNK, JNK1 — 136
 - MAPK8: JNK, JNK1 — 172
- activation: (MAP4K1, MAPK8, HIP-55)
- blocked: (MAP4K1, MAPK8, HIP-55)

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102

Fig. 4A

104 5/9 100

Hematopoietic progenitor kinase 1 (HPK1) is a member of the mitogen-activated protein kinase kinase kinase (MAP4K) family and an upstream activator of the c-Jun N-terminal kinase (JNK) signaling cascade. HPK1 interacts, through its proline-rich domains, with growth factor receptor-bound 2 (Grb2), CT10-regulated kinase (Crk), and Crk-like (CrkL) adaptor proteins. We identified a novel HPK1-interacting protein of 55 kDa (HIP-55), similar to the mouse SH3P7 protein, containing an N-terminal actin-binding domain and a C-terminal Src homology 3 domain. We found that HPK1 bound to HIP-55 both *in vitro* and *in vivo*. When co-transfected, HIP-55 increased HPK1's kinase activity as well as JNK1's kinase activity.

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graph TD
    A["HIP-55: HIP-55"] -- 170 --> B["MAPK8: JNK, JNK1"]
    A -- 162 --> C["MAP4K1: HPK1"]
    B -- 166 --> C
    C -- 172 --> D["HIP-55: HIP-55"]
    C -- 174 --> E["MAPK8: JNK, JNK1"]
    C -- 174 --> F["MAP4K1: HPK1"]
  
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File	Context
URL []	
Hematopoietic progenitor kinase 1 (HPK1) is a member of the mitogen-activated protein kinase kinase kinase (MAP4K) family and an upstream activator of the c-Jun N-terminal kinase (JNK) signaling cascade. HPK1 interacts, through its proline-rich domains, with growth factor receptor-bound 2 (Grb2), CT10-regulated kinase (Crk), and Crk-like (CrkL) adaptor proteins. We identified a novel HPK1-interacting protein of 55 kDa (HIP-55), similar to the mouse SH3P7 protein, containing an N-terminal actin-binding domain and a C-terminal Src homology 3 domain. We found that HPK1 bound to HIP-55 both <i>in vitro</i> and <i>in vivo</i> . When co-transfected, HIP-55 increased HPK1's kinase activity as well as JNK1's kinase activity.	
Entities <ul style="list-style-type: none"> MAP4K1: HPK1 Jun: c-Jun MAPK8: JNK, JNK1 Rsp: receptor GRB2: Grb2 MAGEE1: CT10 CRK: Crk CRKL: CrkL HIP-55: HIP-55 Dbnl: SH3P7 Act5C: actin SRC: Src 	
Interactions <ul style="list-style-type: none"> activated: (MAP4K1, Jun, MAPK8) bound: (MAP4K1, Rsp, GRB2, MAGEE1, CRK, CRKL) regulated: (MAP4K1, Rsp, GRB2, MAGEE1, CRK, CRKL) binding: (MAP4K1, HIP-55, Dbnl, Act5C, SRC) bound: (MAP4K1, HIP-55) increased: (HIP-55, MAP4K1, MAPK8) <ul style="list-style-type: none"> Unassigned Affectors <ul style="list-style-type: none"> HIP-55: HIP-55 Affected <ul style="list-style-type: none"> 136 MAPK8: JNK, JNK1 — 172 MAP4K1: HPK1 — 174 activation: (MAP4K1, MAPK8, HIP-55) blocked: (MAP4K1, MAPK8, HIP-55) 	
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102

Fig. 4B

104 6/9 100

File	Context	
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<p>Hematopoietic progenitor kinase 1 (HPK1) is a member of the mitogen-activated protein kinase kinase kinase (MAP4K) family and an upstream activator of the c-Jun N-terminal kinase (JNK) signaling cascade. HPK1 interacts, through its proline-rich domains, with growth factor receptor-bound 2 (Grb2), CT10-regulated kinase (Crk), and Crk-like (CrkL) adaptor proteins. We identified a novel HPK1-interacting protein of 55 kDa (HIP-55), similar to the mouse SH3P7 protein, containing an N-terminal actin-binding domain and a C-terminal Src homology 3 domain. We found that HPK1 bound to HIP-55 both in vitro and in vivo. When co-transfected, <u>HIP-55</u> increased HPK1's kinase activity as well as JNK1's kinase activity.</p>		
<p>experiment = gals+gal</p> <pre> graph TD GCYL --> GAL2_1[GA^L2] GAL2_1 --> GAL4 GAL4 --> GAL10 GAL4 --> GAL11 GAL4 --> GAL2_2[GA^L2] GAL4 --> GAL2_3[GA^L2] GAL10 --> GAL2_2 GAL11 --> GAL2_3 SRCH --> GAL2_3 SUC2 --> MG1 MG1 --> SHO2 </pre>		
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>Entities</p> <ul style="list-style-type: none"> MAP4K1: HPK1 Jun: c-Jun MAPK8: JNK, JNK1 Rsp: receptor GRB2: Grb2 MAGEE1: CT10 CRK: Crk CRKL: CrkL HIP-55: HIP-55 Dbnl: SH3P7 Act5C: actin SRC: Src </div> <div style="width: 45%;"> <p>Interactions</p> <ul style="list-style-type: none"> activated: (MAP4K1, Jun, MAPK8) bound: (MAP4K1, Rsp, GRB2, MAGEE1, CRK, CRKL) regulated: (MAP4K1, Rsp, GRB2, MAGEE1, CRK, CRKL) binding: (MAP4K1, HIP-55, Dbnl, Act5C, SRC) bound: (MAP4K1, HIP-55) increased: (HIP-55, MAP4K1, MAPK8) activation: (MAP4K1, MAPK8, HIP-55) blocked: (MAP4K1, MAPK8, HIP-55) binds: (HIP-55, MAP4K1, MAPK8) regulates: (HIP-55, MAP4K1, MAPK8) </div> </div>		
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102

Fig. 5

104 7/9 100

File	Context
URL	
<p>Hematopoietic progenitor kinase 1 (HPK1) is a member of the mitogen-activated protein kinase kinase kinase (MAP4K) family and an upstream activator of the c-Jun N-terminal kinase (JNK) signaling cascade. HPK1 interacts, through its proline-rich domains, with growth factor receptor-bound 2 (Grb2), CT10-regulated kinase (Crk), and Crk-like (CrkL) adaptor proteins. We identified a novel HPK1-interacting protein of 55 kDa (HIP-55), similar to the mouse SH3P7 protein, containing an N-terminal actin-binding domain and a C-terminal Src homology 3 domain. We found that HPK1 bound to HIP-55 both <i>in vitro</i> and <i>in vivo</i>. When co-transfected, HIP-55 increased HPK1's kinase activity as well as JNK1's kinase activity.</p>	

Fig. 6B

210

<p>Entities</p> <ul style="list-style-type: none"> MAP4K1: hpk1 GRB2: grb2 CRK: crk CRKL: crkl HIP-55: hip-55 Dbnl: sh3p7 MAPK8: jnk1 	<p>Interactions</p> <ul style="list-style-type: none"> activator: hpk1 -> jnk1; bound: hpk1 -> hip-55; increased: (jnk1) hip-55 -> hpk1; <ul style="list-style-type: none"> Unassigned <ul style="list-style-type: none"> MAPK8: jnk1 Affectors Affected blocked: (hpk1 jnk1 hip-55); activation: (hpk1 jnk1 hip-55); activates: (hpk1 jnk1 hip-55); binds: (hip-55 hpk1 jnk1); regulates: (hip-55 hpk1 jnk1);
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102

Fig. 6A

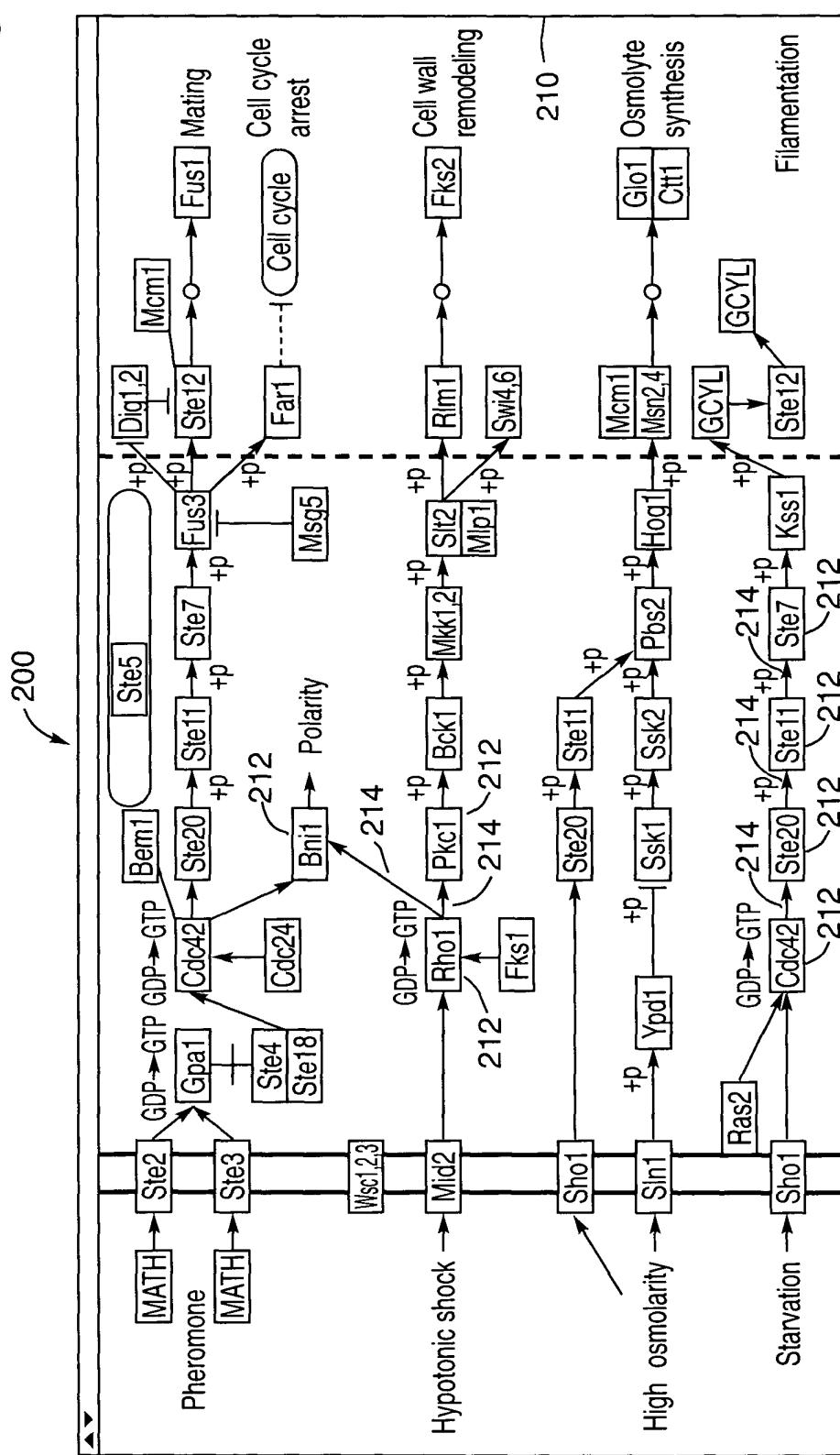


Fig. 6B

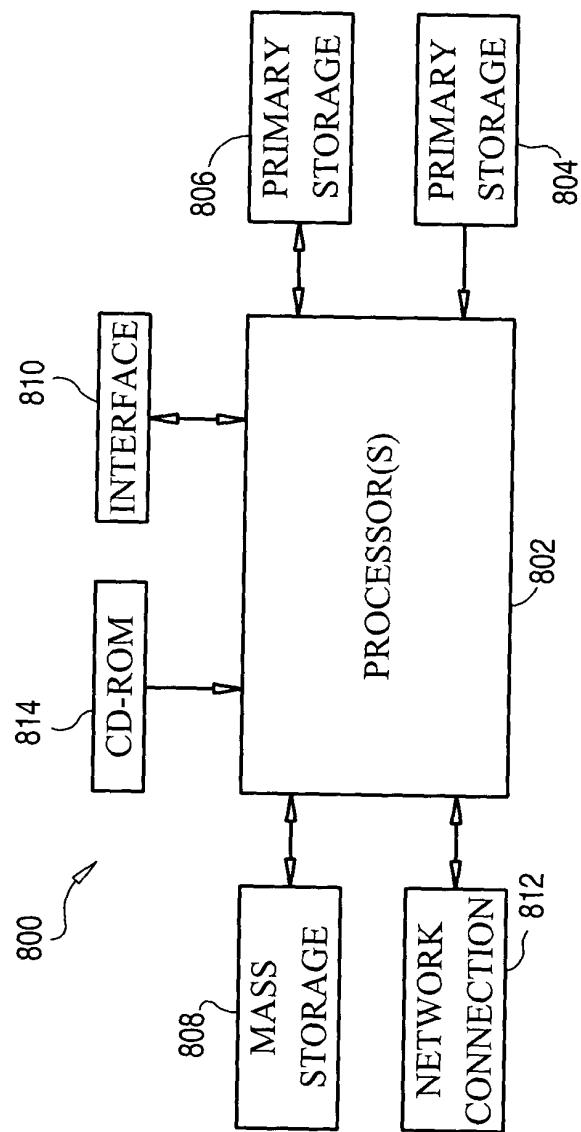


FIG. 9